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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/384,141	08/27/1999	IKKO FUSHIKI	03797.81834	7425

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EXAMINER	
LAROSE, COLIN M	

ART UNIT	PAPER NUMBER
2623	

DATE MAILED: 09/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/384,141	FUSHIKI ET AL.	
	Examiner	Art Unit	
	Colin M. LaRose	2623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 June 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,4,6-23,57 and 60-62* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4,6-23,57 and 60-62* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Arguments and Amendments

1. Applicant's amendments and/or arguments filed 16 June 2005, have been entered and made of record.

Response to Arguments

2. Applicant's remarks (pp. 8-9) primarily concern the properties of the sRGB color space. Applicant correctly points out that in a previous Interview, Examiner agreed that, based on Applicant's disclosure, sRGB is a "perceptual-based" color space. Other disclosures by the present inventor(s) also establish this fact (see e.g. USP 6,462,748 – column 1, lines 38-58).

However, the Holm reference fairly discloses that the sRGB color space is known to be a "physical-based" color space. Numerous passages in Holm refer to sRGB as an "alternative to perceptual color spaces [that is] physically standardized" and which "describe[s] the physical meaning of the data" (column 13, lines 23-30). In Table 3, Holm compares perceptual-based color spaces to sRGB color spaces. In the table, Holm identifies an advantage of sRGB as the fact that "sRGB image data can also be described perceptually." This suggests that sRGB can be described as either perceptual-based or physical-based. Indeed, Holm discloses that physical-based color spaces can be "correlate[d] ... to current appearance model descriptions for limited sets of viewing conditions" (column 13, lines 25-29).

So according to Holm, the sRGB color space is a physical-based color space, which can also be "described" perceptually. Whereas the present invention utilizes sRGB as a perceptual color space only, Holm utilizes sRGB as a physical-based color space and teaches that sRGB is

not exclusively physical-based or perceptual-based, but may be described as either depending on the application. Therefore, the combination of Holm and Pritchett is not rendered invalid at least because conversions between perceptual and physical-based color spaces are not required by the claims.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 1, 4, 6-9, 11-17, 19-23, 57, and 60-62 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,249,315 by Holm in view of U.S. Patent 5,946,113 by Pritchett.

Regarding claims 1, 15, 23, 57, and 60-62, Holm discloses a method/apparatus/computer readable medium for providing a color space representation of color images in a color management system, comprising the steps of:

mapping RGB color data values representing an image in a first device into sRGB color data values of an sRGB color space; and

[column 15, "Processing Step 1": the input image data is divided into color channels, if needed; column 6, lines 8-10: the input device is an RGB camera or scanner]

[column 16, "Processing Step 2" and columns 19 and 20, "Processing Steps 4 and 6": the input image data is linearized and converted to standard RGB (i.e. sRGB) color data values; column 13, lines 7-30: in contrast to perceptual color spaces, such as XYZ and L*a*b*, sRGB is a physical color space]

converting the sRGB color data values of the sRGB color space into RGB color data values representing an image in a second device, the RGB color data values of the first device being different from the RGB color data values of the second device and the physical appearance of the image in the first device being the same as the physical appearance of the image in the second device.

[column 20, "Processing Step 7": an output LUT is applied to convert the sRGB color data values into an RGB color values for an output device]

[column 11, lines 13-29: in linear reproduction, the reproduction and the original are identical according to some physical criteria, so their physical appearances of the images in the input and output devices are the same]

Holm discloses that a disadvantage to utilizing the sRGB color space is that colors that are out of an output device's range (such as the range of a monitor) are expressed by negative values. Therefore, a larger volume of data is required. See Table 3, column 14.

However, Holm does not disclose that the RGB color data values are converted into gamut expanded sRGB (i.e. "XsRGB") color data values.

Pritchett discloses a method for converting an input color space into an output color space via an intermediate color space with an expanded gamut (see column 2, lines 41-49). Pritchett teaches that when converting the color data values of an input device (such as a video camera) into those of an output device (such as a monitor), conversion artifacts may appear because the input color space may have a larger gamut than the output color space. To remedy this problem, Pritchett discloses utilizing an intermediate color space with an expanded gamut so that all valid

colors from the first color space can be accurately converted to the output color space. For example, the valid range of an RGB color space is extended from [0,1] to [-4,4] to provide an intermediate expanded gamut RGB color space. Column 6, lines 18-22.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Holm by Pritchett to utilize an expanded gamut sRGB color space, as claimed, since Holm recognizes the need to represent the intermediate sRGB color data values that are outside the gamut of an output device such as a monitor (Table 3), and Pritchett discloses that the problem of an input device's gamut being larger than an output device's gamut is preferably solved by extending the gamut of an intermediate color space, which in Holm's disclosure, corresponds to a linearized sRGB color space.

Further in regards to claim 60, Holm does not disclose an alpha channel, as claimed. However, Pritchett shows that including an alpha channel was conventional and would have been an obvious modification to Holm since Pritchett teaches the alpha channel provides useful additional information pertaining to the opacity of a pixel in an RGB format. See column 7, lines 3-25.

Regarding claim 4, Pritchett discloses clipping the extended RGB color data values for the destination color space when the RGB values lie outside a predetermined range (column 8, lines 25-30).

Regarding claim 6, the combination of Holm and Pritchett discloses the gamut expanded sRGB color space is linear in visual intensity (column 8, lines 31-50: the input color space is

linearized and then converted into an sRGB color space, so the expanded sRGB color space is also linear).

Regarding claims 7 and 16, the combination of Holm and Pritchett discloses an extended sRGB color space comprises an XsRGB color space (i.e. and expanded gamut sRGB color space) that includes at least the visible range of color values (Pritchett, column 6, lines 15-22: the extended space accommodates the entire valid range of color), is defined by a gamut that extends beyond normalized values (Pritchett, column 5, lines 1-4 and column 6, lines 18-22), and may include an alpha channel for at least one of transparency information and opaqueness information (Pritchett, column 7, lines 3-15).

Regarding claim 8, Pritchett teaches the expanded RGB color space extending beyond the range of [0, 1.0] when normalized to 1.0 in RGB (column 5, lines 1-4 and column 6, lines 18-22).

Regarding claims 9 and 17, Holm the mapping includes multiplying the linearized RGB values by a predetermined matrix as claimed (column 20, "Processing Step 6").

Regarding claims 11 and 12, these claims appear to recite features that do not constitute critical inventive aspects of the present invention. Rather, they seem to denote design preferences that do not substantially alter the functionality of the system as a whole.

Regarding claim 11, Pritchett discloses representing the extended RGB with 13 bits to cover the extended RBG range of (-4, 4). Ten bits are used for fractional portions, two bits for integer portions, and one sign bit (column 6, lines 18-22).

One of ordinary skill in the art recognizes the advantage of using a large number of bits to represent digital image data. Therefore, Pritchett's representation of color data value using 13

bits (rather than 16 or 17 or 18, etc.) is a design choice. Applicant's specification states "... in one embodiment, color data values may be expressed in a signed 16-bit integer... " This suggests that the choice of 16 bits to represent extended RGB data is not an inventive step and is merely a design choice.

Regarding claims 12 and 20, techniques for converting normalized color data to 16-bit color data by the multiplication of a scalar were well known to those of ordinary skill in the art at the time of the invention. These claims are necessitated by the choice of representing color data in 16 bits and do not present any inventive steps.

Regarding claims 13, 19, and 21 Pritchett discloses clipping extended RGB values to RGB values (column 8, lines 25-30). In Pritchett's embodiment, RGB data is represented by ten bits (column 5, lines 6-9), and extended RGB data is represented by 13 bits (column 6, lines 18-22), so clamping involves transforming color space data from 13 to 10 bits.

As stated above, Pritchett's representation of extended RGB with 13 bits is a design choice. Similarly, the representation of RGB data in ten bits is also a design choice. Therefore, choosing to clip 16-bit data to 8-bit data rather than 13-bit data to 10-bit data is a design choice, and no inventive steps are taken.

Regarding claims 14 and 22, the color data values of Holm's first device are either premultiplied or non-premultiplied.

4. Claims 10 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,249,315 by Holm in view of U.S. Patent 5,946,113 by Pritchett, as applied to claims 9

and 17, and further in view of IEC 61966-2-1 (which was previously cited in the PTO-892 form dated 16 January 2003 as "IEC TC100 sRGB Draft Standard, 1998").

Regarding claims 10 and 18, Holm discloses that the sRGB color space is obtained by a standardized transformation (column 7, lines 56-60).

However, Holm is silent to the particular claimed transformation.

IEC 61966-2-1 discloses the standardized method for mapping RGB color data values into sRGB. In particular, IEC 61966-2-1 discloses the claimed matrix transformation (equation 6). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Holm to utilize the claimed matrix since Holm teaches that the sRGB color space is obtained by a standardized transformation, and IEC 61966-2-1 discloses a standardized transformation for obtaining sRGB color data values.

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Colin M. LaRose whose telephone number is (571) 272-7423. If attempts to reach the examiner by telephone are unsuccessful, the examiner's acting supervisor, Jingge Wu, can be reached on (571) 272-7429. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the TC 2600 Customer Service Office whose telephone number is (571) 272-2600.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CML
Group Art Unit 2623
9 September 2005

VIKKRAM BALI
PRIMARY EXAMINER